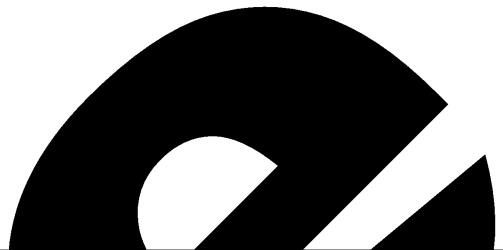
Sanitized Copy Approved for Release 2010/03/05 : CIA-RDP85T00875R00170002



CIM/OER/IM 71-238

25X1

Secret

DIRECTORATE OF
INTELLIGENCE

Intelligence Memorandum

Uranium in Niger

Secret

ER IM 71-238
December 1971

Copy No. 40

WARNING

This document contains information affecting the national defense of the United States, within the meaning of Title 18, sections 793 and 794, of the US Code, as amended. Its transmission or revelation of its contents to or receipt by an unauthorized person is prohibited by law.

Sanitized Copy Approved for Release 2010/03/05 : CIA-RDP85T00875R001700020091-8

CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
December 1971

INTELLIGENCE MEMORANDUM

URANIUM IN NIGER

Introduction

1. Niger, the world's newest uranium producer, may become an important supplier of uranium oxide in the next few years. Foreign interests are seeking actively to determine the full extent of the uranium reserves, and Nigeriens anticipate that the uranium industry will make a significant contribution to their domestic economic development. This memorandum examines the current and potential uranium operations, relates future expansion plans to world demand for uranium, and assesses the industry's likely economic impact on Niger.

Discussion

Background

2. Until recently, Niger, a land-locked, sparsely populated country as large as Texas, Arizona, and New Mexico combined, has been of little interest to foreigners other than the former French colonial overlords. It is mainly desert, with its economically important area limited to lands along the Niger River and bordering on Nigeria. More than 50% of the population thus is concentrated on less than 10% of the land. Economic activity long has been confined to nomadic livestock raising and to rudimentary crop cultivation, which occupies only about 2% of the total area. Water scarcity and poor soils keep agricultural productivity low. Peanuts, the only significant cash and export crop, are of great importance to Niger but not to the world market.

Note: This memorandum was prepared jointly by the Office of Economic Research and the Office of Scientific Intelligence and coordinated within CIA.

3. Niger's economic prospects brightened with the 1965 discovery of uranium just west of the Air Mountains near Arlit (Figure 1). Foreign interest in Niger was stimulated quickly, and by 1970, ten uranium exploration concessions had been granted. The French Atomic Energy Commission (CEA) holds seven of the permits, and Essex Iron Company, a wholly-owned subsidiary of U.S. Steel, holds the remaining three. West German, Italian, Japanese, and French private interests also became involved through partnership arrangements with the CEA and the government of Niger.

4. Niger's Arlit deposit has reasonably proved reserves of about 26,000 metric tons of uranium oxide (U_3O_8).* Exploration to date suggests that total reserves are much larger and that Niger possibly ranks fifth among Western countries, although its reserves are much smaller than those of the United States, Canada, and South Africa (Table 1). All the deposits discovered thus far lie in isolated areas. Although development is consequently expensive, it is estimated that the 65,000 tons of combined, proved, and possible reserves of uranium oxide could be exploited at an economically acceptable cost of less than $10 per pound.

Mining Developments

Operations at Arlit

5. In January 1971 the Societe des Mines de l'Air (SOMAIR) became Niger's first uranium producer. SOMAIR is a mixed company comprising the following participants, each of which provided initial capital in proportion to its share of ownership:

Participant	Percentage of Ownership	Capital Provided (Million US $)
French Atomic Energy Commission (CEA)	33.6	3.6
Government of Niger	16.8	1.8
Mokta el Hadid (French)	16.8	1.8
Compagnie Francaise des Minerais d'Uranium (French)	16.8	1.8
Urangesellschaft (West German)	8.0	0.9
AGIP-Nucleare (Italian)	8.0	0.9
Total	*100.0*	*10.8*

* Measurements are made in terms of uranium oxide because ore purchases are made on this basis. Uranium oxide contains 84.8% uranium.

Table 1

Western World: Estimated Major Resources of Uranium a/
1971

Thousand Metric Tons of Uranium Oxide

Country	Reasonably Proved Resources	Estimated Additional Reserves b/
United States	340	600
Canada	232	300
South Africa	200	15
France	45	25
Niger	26	39
Australia	20	6
Gabon	14	7
Spain	11	0
Central African Republic	10	10
Argentina	10	22
Portugal	10	8
Japan	3	0
Italy	1	0
Others	11	10
Total	*933*	*1,042*

a. Estimates are of deposits that could be mined at a cost of less than $10 per pound of uranium oxide. Deposits that could be mined at costs of between $10 and $15 per pound have been estimated at more than a million tons of uranium oxide, but exploiting such deposits probably would not be economic before the mid-1980s at the earliest.
b. Amounts judged to exist in unexplored extensions of known deposits or in undiscovered deposits in known uranium districts.

Estimated total investment for the processing plants, mine, company town, and planned expansions is about $56 million with the initial equity included. The necessary additional capital is being provided by the share holders and French public financial sources.

6. The mining town (Arlit) is under construction about 155 miles north of Agadez, a trading town (Figure 2). The site is in a barren area previously inhabited only by a few nomads. Eventually, Arlit is expected to have a population of about 5,000; facilities already built include a large number of the planned 400 houses, an 8,600 kilowatt generating plant, an airstrip that can accommodate DC-4 aircraft, and several recreational facilities. Construction plans also include a hotel-restaurant, other commercial facilities, and a 20-bed hospital.

7. The mine (officially named Arlette, but more frequently called Arlit) and a concentrating mill lie five miles from the town. About 3 million tons of overburden were removed to allow open-pit mining. The ore averages 0.25% uranium oxide, which compares well with other deposits in the world. The mill has an annual capacity of about 1,000 tons of concentrate containing 880 tons of uranium oxide (750 tons of recoverable uranium metal) and currently is operating at full capacity. Work has begun on a second mill to double capacity by 1974.

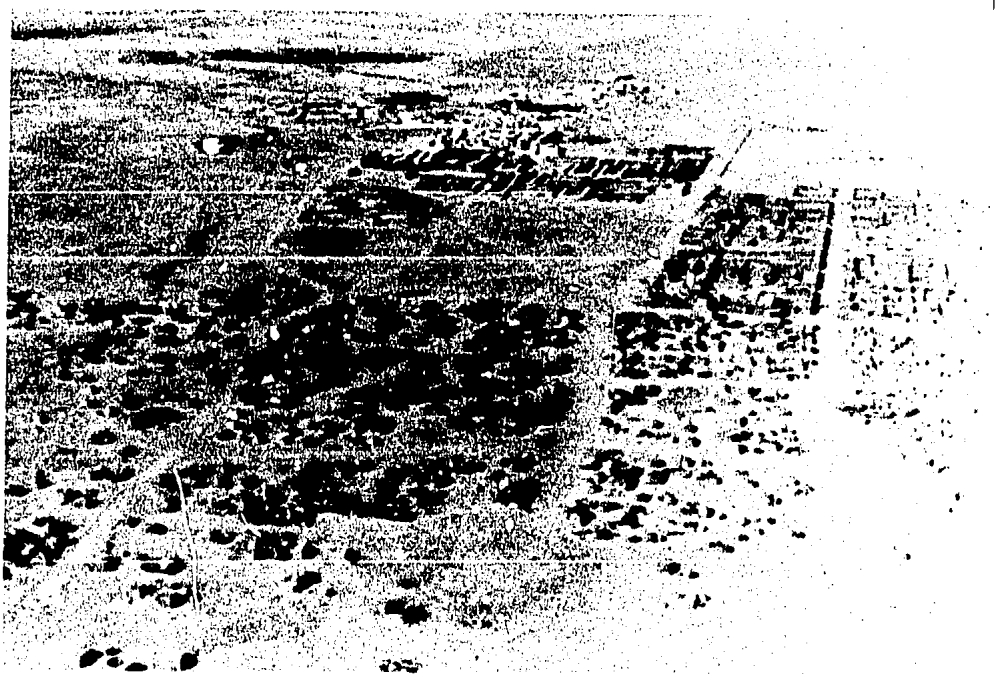
8. Through exploitation of the Arlit deposits alone, Niger may rank fifth in uranium production in the Western world by the mid-1970s. If output amounts to 1,760 tons annually after 1974, as planned, Niger probably will surpass Australia and nearly equal France (Table 2). Such an output would constitute about 4% of Western world production and would, of course, be far below that of the United States and Canada.

9. At the moment, transport of the concentrates to the sea is costly. The shipping route to Dahomey's port of Cotonou covers about 1,300 miles -- some 400 miles by graded sandtrack from Arlit to Tahoua, then 650 miles by road to Parakou, Dahomey, and the remainder by rail. The cost of transportation to the port reportedly runs about $2 per pound, or between one-fifth and one-third of total costs. A paved two-lane highway linking Arlit to Tahoua is under construction and should reduce shipping costs substantially. It is being funded by France, West Germany, and the European Development Fund (FED). In a further attempt to lower transportation costs, SOMAIR will be shipping an approximately 80% concentrate rather than the originally planned 75% concentrate.

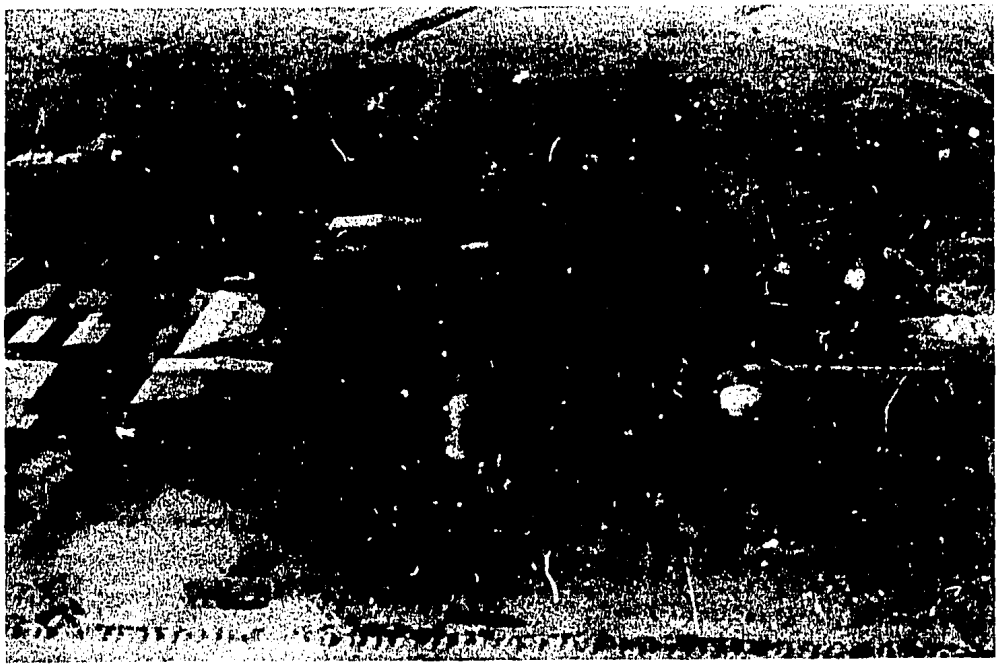
10. Initially, the agreements forming SOMAIR put full control of uranium sales in French hands, but changes were made when German and Italian interests joined the venture. Although the German and Italian companies are guaranteed shares of uranium output proportionately larger than their 8% shares of ownership in SOMAIR, the French remain the privileged, dominant customer. The possibility of a role for the Niger government in sales control was not foreclosed when SOMAIR was formed, but outside of stipulating that the uranium was to be used only for peaceful

FIGURE 2

Arlit's mine (with the processing plant in the background). The photograph reflects the isolated and barren character of Niger's uranium region.



The town of Arlit, with nomadic encampments in the lower half of the photograph.



Arlit's uranium-processing facilities near the mine.

Nigerien workers operating heavy equipment at the Airlit mine.

Table 2

Western World: Uranium Production and Projected Production Capacity

Metric Tons of Uranium Oxide

Country	Uranium Oxide Production 1969	Projected Production Capacity	
		Planned for 1973 [a]	Attainable by 1975 [b]
United States	10,520	17,230	20,860
Canada	4,080	4,990	11,790
South Africa	3,630	5,440	5,440
France	1,450	2,090	2,090
Niger	0	880	1,760
Australia	300	1,360	1,360
Gabon	590	710	710
Spain	60	500	500
Central African Republic	0	710	710
Argentina	50	80	80
Portugal	90	270	270
Italy	0	110	110
Mexico	40	180	180
Japan	0	40	40
Total	*20,810*	*34,590*	*45,960*

a. Assumed to be the same as in 1970 for Canada and France and the same as in 1971 for Niger.
b. Assuming that market conditions justify it.

purposes and should not go to the People's Republic of China, Niger appears to be indifferent as to the direction of sales.

Potential of the Akokan and Other Deposits

11. Some 15 miles south of Arlit in the Akokan area, CEA and the Overseas Uranium Resources Development Company (OURD), a private Japanese firm, are investigating a large deposit that could be an extension of the Arlit vein. CEA specialists have estimated -- but not yet proved -- the reserves at between 21,000 and 26,000 tons of uranium oxide that might be minable at a cost of less than $10 per pound. The crude ore apparently contains close to 0.4% uranium oxide, a higher content than at Arlit. Deposits are located at depths of 500 to 1,300 feet, however, and exploitation would require underground mining, which is more expensive.

12. Tentative plans for exploiting the Akokan deposit have been outlined, but the decision on whether to proceed will not be made until 1972 or thereafter, when the prospecting data will have been evaluated. A joint venture is planned, with OURD owning a 25% share and the remainder divided in an as yet undetermined ratio between French interests and the Niger government. The cost of developing the operation is estimated at between $60 million and $64 million. In addition to the underground mine, a mill having an annual capacity of about 2,000 tons of concentrate (about 1,500 tons of recoverable uranium metal) would be constructed. Some 1,500 people would be employed. Uranium shipments would begin in 1977, with the mill operating at 40% capacity; production would be increased to 60% of capacity in 1978 and to full capacity after 1979.

13. Niger possesses other uranium deposits, mostly in the general vicinity of Arlit. The Nigeriens believe that the most promising is in the Imouraren area, about 30 miles south of Arlit, where drill cores indicate that the uranium, like that of Akokan, is at depths of 500 to 1,300 feet. However, the uranium appears to be scattered in varying concentrations throughout the area rather than existing in a continuous seam. The expense of underground mining would require an average uranium content of at least 0.35% to make the operation feasible. The Japanese showed interest in Imouraren before deciding to investigate Akokan, and Niger officials have stated they would welcome US private investment in this deposit. Madouela, an area a few miles southeast of Arlit, could contain some 5,000-6,000 tons of uranium oxide, and Azelik, just east of the trans-Saharan route going north to Algeria, may contain 3,400 to 5,000 tons. Neither deposit is considered profitable to exploit in the near future because of the high percentage of lime carbonate mixed with the uranium oxide and the depth at which the deposits lie.

Prospective Marketing Situation

14. In recent years, the Western world's uranium oxide consumption has been below both productive capacity and actual output; thus stockpiling has occurred. This imbalance may well continue for a time because capacity is increasing in anticipation of future requirements. Productive capacity is planned to rise by about 25%, to 35,000 tons, between 1971 and 1973, and a further increase in capacity of roughly 33% is attainable by 1975. International Atomic Energy Agency estimates of a 150% growth in consumer requirements between 1971 and 1975 would bring them to about 34,000 tons annually, or less than the attainable capacity of 46,000 tons in 1975. Yet a possible further doubling of demand by 1980 would require a still greater capacity by that time. In any case, the existence of overcapacity into the mid-1970s should not create great difficulty for Niger uranium because of the captive nature of much of its market.

15. Current production from the Arlit mine is being taken by West Germany and Italy, which have small domestic deposits, and by France. The planned doubling of output at Arlit and the eventual exploitation of other deposits probably would require some sales on the international market, however. Such sales might be difficult at the present high production costs, but as transportation is improved and the production scale increased, unit costs should drop. Niger uranium probably would be sold in the world market through URANEX, a French sales organization.

Benefits to Niger

16. Although it is not clear what price would be received, uranium oxide shipments perhaps could double Niger's exports by 1975, sharply narrowing the chronic trade deficit. Export sales of uranium oxide typically are negotiated independently by individual buyers and sellers; thus few price quotations are available. It is known that prices ranged between $5 and $7 per pound when the CEA agreed in 1971 to sell some of its uranium oxide stock. At $6 per pound, Arlit's current production is worth $11.6 million annually, and the production capacity of 1,760 tons available after 1974 would yield about $23 million annually.

17. New and improved infrastructure and related benefits also will accrue from the Arlit operation. Infrastructure development in the remote central region will help to tie it to the more developed south In addition to getting improved roads, the government hopes that uranium mining will provide the economic justification for a development project to extend the Dahomey railroad from its terminus at Parakou some 300 miles to Dosso, Niger. The cement plant at Malbaza (Niger's largest industrial project, built at a cost of $6 million) finally may be made a profitable venture by

supplying Arlit's construction needs. Some of Niger's nomadic Tuaregs, the most difficult ethnic group to bring into the monetized economy, have settled around the mining site and are being trained for mine and construction labor and for crop raising (mainly fresh fruits and vegetables). Employment at Arlit now numbers between 100 and 120 Europeans and between 350 and 450 Nigeriens; by 1975 the African labor force may reach about 900, or 8% of the country's wage earners outside of the government. Some Nigeriens, mostly from the south, are being trained by the French to assume technical positions at the mine.

18. The Arlit operation also is significant as a new source of revenue for the Niger government. Revenues from traditional sources -- head taxes, income taxes, and import duties from other than uranium mining supplies -- cannot be increased much beyond current levels without creating significant hardship for Niger's people. The new source has the advantage of deriving from predominantly foreign interests. Government revenues from Arlit probably will amount to $1.4 million-$2 million annually by 1975. Under a 20-year agreement, Niger will receive a 40.5% tax on net profits and a 1% tax on uranium exports. In addition, Niger can tax company salaries and its partners' dividends. By 1985, revenues should increase to $4 million or $5 million annually.

Conclusions

19. Uranium mining means a moderate boost for Niger's economic development -- a significant fact in view of the paucity of economic opportunities. Increased revenues, improved infrastructure, and more jobs will emerge from the Arlit operation, and eventual exploitation of other uranium deposits should bring additional, similar benefits. Proved reserves amount to at least 26,000 tons of uranium oxide, but the actual reserves may be much larger. The Akokan deposit alone could more than double present proved reserves, and the increasing intensity of prospecting indicates that additional finds are likely.

20. The West European partners in the venture represent a captive market for Arlit's current production, but expansion of Arlit and exploitation of additional deposits will require sales on the international market. While production costs are relatively high, such exploitation is apparently economically feasible. Fortunately for Niger, world consumption of uranium is rising rapidly, and, if current demand trends continue, a sufficient part of the international market probably will be available to support Niger's planned production in the mid-1970s.